REMARKS/ARGUMENTS

Claims 1-41 were previously pending in the application. Claims 23-25 and 29-39 are canceled as non-elected restricted-out claims; claims 7, 11-18, and 26 are amended; and new claims 42-49 are added herein. Assuming the entry of this amendment, claims 1-22, 26-28, and 40-49 are now pending in the application. The Applicant hereby requests further examination and reconsideration of the application in view of the foregoing amendments and these remarks/arguments.

Specification:

The specification is amended to (i) insert the serial number of a cited application on pages 1 and 3 and (ii) correct an inadvertent typographical error on page 1.

Claims:

On page 3, the Examiner rejected claims 1, 3, 6, 8-10, 12-21, 26, 28, and 40 under 35 U.S.C. § 102(b) as being anticipated by Roeder. On page 5, the Examiner rejected claims 4, 5, and 7 under 35 U.S.C. § 103(a) as being unpatentable over Roeder in view of Hearle (as presented by Zhang). On page 6, the Examiner rejected claim 22 under 35 U.S.C. § 103(a) as being unpatentable over Roeder. On page 6, the Examiner rejected claim 11 under 35 U.S.C. § 103(a) as being unpatentable over Roeder in view of Chandross. On page 7, the Examiner rejected claims 2, 27, and 41 under 35 U.S.C. § 103(a) as being unpatentable over Roeder in view of Kumar. For the following reasons, the Applicant submits that all pending claims are allowable over the cited references.

Support for the amendments of independent claims 26 and 40 can be found, e.g., in claim 1. Support for new claims 42, 45, and 47 can be found, e.g., in original claims 9-10 and on page 1, lines 23-32. Support for new claims 43-44, 46, and 48-49 can be found, e.g., in original claim 7 and on page 2, lines 15-20.

Claim 1 is directed to a method for assembling carbon particles into at least one aligned carbon fiber. The method has the step of drawing glass containing said carbon particles so as **to form** at least one **carbon fiber** from said carbon particles.

Roeder discloses a method of embedding **already formed** fiber bundles into a glass matrix for the production of a composite material that has improved mechanical characteristics compared to those of unreinforced glass. According to this method, a **prefabricated** (carbon or silicon-carbide) **fiber** bundle is impregnated with glass powder and placed into a hollow mandrel. The tip of the hollow mandrel has a cone-shaped taper with a hole connecting the mandrel to a glass-melt volume. The glass melt is extruded from the volume through a die channel. The glass-impregnated fiber bundle is drawn through the hole in the mandrel into the glass-melt volume and is pushed together with the glass melt through the die channel to form a glass rod or profile having a fiber-reinforced core. (See pages 10-12 in Roeder.)

The prefabricated fibers used in the method of Roeder are relatively long fibers spooled on cardboard rolls. At about 600 °C, the sizing that covers the spooled fibers is stripped off and the individual filaments of each fiber are loosened from one another. The fibers thus treated are cut to a suitable length and a relatively large number of the resulting fiber pieces are bundled together to form, after the glass impregnation, the prefabricated fiber bundle, which is then placed into the hollow mandrel. (See page 18 in Roeder.)

To impregnate a fiber bundle with glass powder, the fiber bundle is immersed, for approximately 45 seconds, into a suspension of boiling alcohol and glass powder. The boiling of

the alcohol swirls and agitates the glass powder to uniformly distribute the glass powder in the liquid. When the fiber bundle is immersed into this boiling suspension, the glass powder infiltrates the fiber bundle. After the fiber bundle is removed from the boiling suspension and the alcohol is evaporated, the glass powder that has infiltrated the fiber bundle adheres to the individual fiber filaments, thereby forming the glass-impregnated fiber bundle. (See pages 13 and 19 in Roeder.)

Thus, the method of Roeder differs from the method of claim 1 in at least that, in the former method, glass is drawn to embed into it the **already existing, previously formed** carbon fiber obtained from an external source (e.g., a cardboard spool), whereas in the latter method, glass is drawn **to form** a carbon fiber from carbon particles contained in the glass, with the fiber being formed as the glass is being drawn. For at least this reason, the Applicant submits that the Examiner misinterpreted the teachings of Roeder and used them improperly to reject claim 1. It is therefore submitted that claim 1 is allowable over Roeder and its rejection over Roeder should be withdrawn. For a similar reason, it is submitted that claims 26 and 40 are allowable over Roeder. Since the rest of the claims depend variously from claims 1, 26, and 40, it is further submitted that those claims are allowable over Roeder and the cited reference combinations that include Roeder. The Applicant submits therefore that the rejections of claims under §§ 102 and 103 have been overcome.

New claim 45, which depends from claim 1, further specifies that the method has the steps of: (A) dispersing said carbon particles within a form of liquid glass to form a sol-gel solution; and (B) solidifying the sol-gel solution to form a glass body containing therein said carbon particles. The step of drawing recited in claim 1 comprises: (C) drawing said glass body into the at least one carbon fiber. New claims 42 and 47, which depend from claims 40 and 26, respectively, have similar limitations.

The Applicant submits that the method of Roeder differs from the method recited in claim 45 in at least the following respects. First of all, claim 45 recites the step of **dispersing carbon particles** within a form of liquid glass to form a sol-gel solution. The term "dispersing" means distributing more or less evenly throughout a medium (see, for example, Webster's Ninth New Collegiate Dictionary, 1987, Merriam-Webster, Springfield, Massachusetts, p. 365). In the method of Roeder, glass particles, **not carbon particles, are being dispersed** in alcohol, whereas the fibers of the fiber bundle, which contain carbon particles, remain structurally intact and are not being dispersed in any manner at all. In addition, claim 45 recites the step of **solidifying** the sol-gel solution to form a glass body containing therein said carbon particles. Solidifying a substance means making that substance solid or hard (see, for example, Webster's Ninth New Collegiate Dictionary, 1987, Merriam-Webster, Springfield, Massachusetts, p. 1122). In the method of Roeder, the already solid glass particles of the glass/alcohol suspension adhere to the already solid fiber bundle. Thus, in the method of Roeder, **one solid** is simply **aggregated with another solid**, and no solution or mixture is being solidified to form a glass body to be drawn as required by claim 45.

The Applicant submits that none of the other references can rectify the deficiencies of Roeder with respect to claim 45. More specifically, Zhang discloses spinning of multi-walled carbon nanotubes into torque-stabilized carbon-nanotube yarns. Kumar discloses synthesis of poly-p-phenylene benzobisoxazole (PBO) in the presence of carbon nanotubes to produce carbon-nanotube-containing polymer composites. Chandross discloses casting relatively large, crack-free silica bodies from a sol of colloidal silica in water. The Applicant submits that the cited references, independently or in combination, do not teach or suggest at least the steps of (A) dispersing carbon particles within a form of liquid glass to form a sol-gel solution and (B) solidifying the sol-gel solution to form a glass body containing therein said carbon particles.

All these facts provide additional reasons for the allowability of claim 45 over the cited references. At least some of these reasons similarly apply to the allowability of claims 42 and 47 over the cited references.

With respect to previously presented claim 10, the Applicant specifically notes that the Examiner's rejection of that claim is improper and should be withdrawn. In particular, claim 10 and its base claims recite the steps of (a) solidifying a mixture of carbon particles within a sol-gel solution whereby a body is formed and (b) dispersing carbon particles within said sol-gel solution to form said mixture. For at least some of the reasons already explained above in reference to claim 45, the Applicant submits that Roeder does not teach or even suggest such steps. It is therefore follows that the Examiner misinterpreted the teachings of Roeder and used them improperly to reject previously presented claim 10.

New claim 46, which depends from claim 45, further specifies that (i) the drawing step produces a plurality of aligned carbon fibers and (ii) the method further comprises the step of **expelling** glass that is located between and within said aligned carbon fibers. New claims 43 and 48, which depend from claims 42 and 47, respectively, recite similar limitations. The Applicant submits that the cited references, independently or in combination, do not teach or suggest such a combination of features. For example, Roeder teaches away from expelling glass, in that he teaches deliberately impregnating fiber bundles with glass. Furthermore, Roeder does not contemplate expelling glass from the bundles at any point. Zhang and Kumar do not use glass at all in their respective methods and, as such, cannot possibly teach expelling glass. Finally, Chandross does not use carbon fibers in his casting method and, as such, cannot possibly teach expelling glass from carbon fibers. All these facts provide additional reasons for the allowability of claims 43, 45, and 48 and also claims 44, 7, and 49, which depend from claims 43, 45, and 48, respectively, over the cited references.

In view of the above amendments and remarks, the Applicant believes that the now-pending claims are in condition for allowance. Therefore, the Applicant believes that the entire application is now in condition for allowance, and early and favorable action is respectfully solicited.

Respectfully submitted,

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